

DYNAMIC COMPILATION CONTROL TECHNIQUE

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ABSTRACT OF THE DISCLOSURE

[1097] Modern programming languages have stimulated work on systems that
5 dynamically compile or optimize frequently executed portions of programs. In
practice, such systems typically rely on ad hoc heuristics. For example, a system may
optimize (or compile) some code once its execution count exceeds a given threshold.
An analytical model has been developed that expresses performance of such a system.
In one embodiment, the model is based on a bytecode frequency histogram, which
10 indicates (for a given program) how many bytecodes run for how many times. It
predicts that the optimal compilation threshold will occur where the hazard rate falls
through the reciprocal of the break-even point, the number of times a compiled
bytecode must be executed to recoup its compilation time. Based on the insight
provided by the model, a dynamic compilation control technique has been developed.